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Studies on the parasite fauna of Thailand

4. Five new species of trombiculid mites found in Thailand (Prostigmata : Trombiculidae)

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(Director : Prof. Kaoru HAYASHI)

Abstract : Reporting here is the description about five new species of Trombiculid mites collected in Thailand. They were collected as unengorged larva by Tullgren apparatus from soils which were suspected to have nest-tunnels of the field rat.

INTRODUCTION

In July and August of 1978 and February 1979, a survey on ectoparasites from small mammals was conducted as a part of "Phylogenic and Taxonomic Studies on Parasites in Southeast Asia" sponsored by Oversea's Research Grant No. 304105(1978), Ministry of Education, Science and Culture of Japan (Leader, Prof. Masashi OHBAYASHI).

Specimens collected in the survey were classified into fleas, lice, ticks, trombiculid mites and other mites. A report on other mites has heen already made by Uchikawa and Suzuki (1980), although the studies are to be continued.

The followings are the description as to the five new species of Trombiculid mites collected in the above survey.

Walchia (*Ripiaspichia*) *khunyingi* SUZUKI, n. sp., Fig. 1 (A-G).

Diagnosis of Larva: This new species carries the scutum resembling to that of *W.* (*R.*) *hayashii* SUZUKI, 1979 but it has the palpal formula of B/B/BNN which is different from that of *hayashii*; N/N/NNN. It also resembles to *W.* (*R.*) *simulata* of palpal formula of N/N/BNN and palpal femur and palpal genu; the new is branched and the other is not.

Description of Holotype Larva: White body color as in alive. 130μm long and 120 μm

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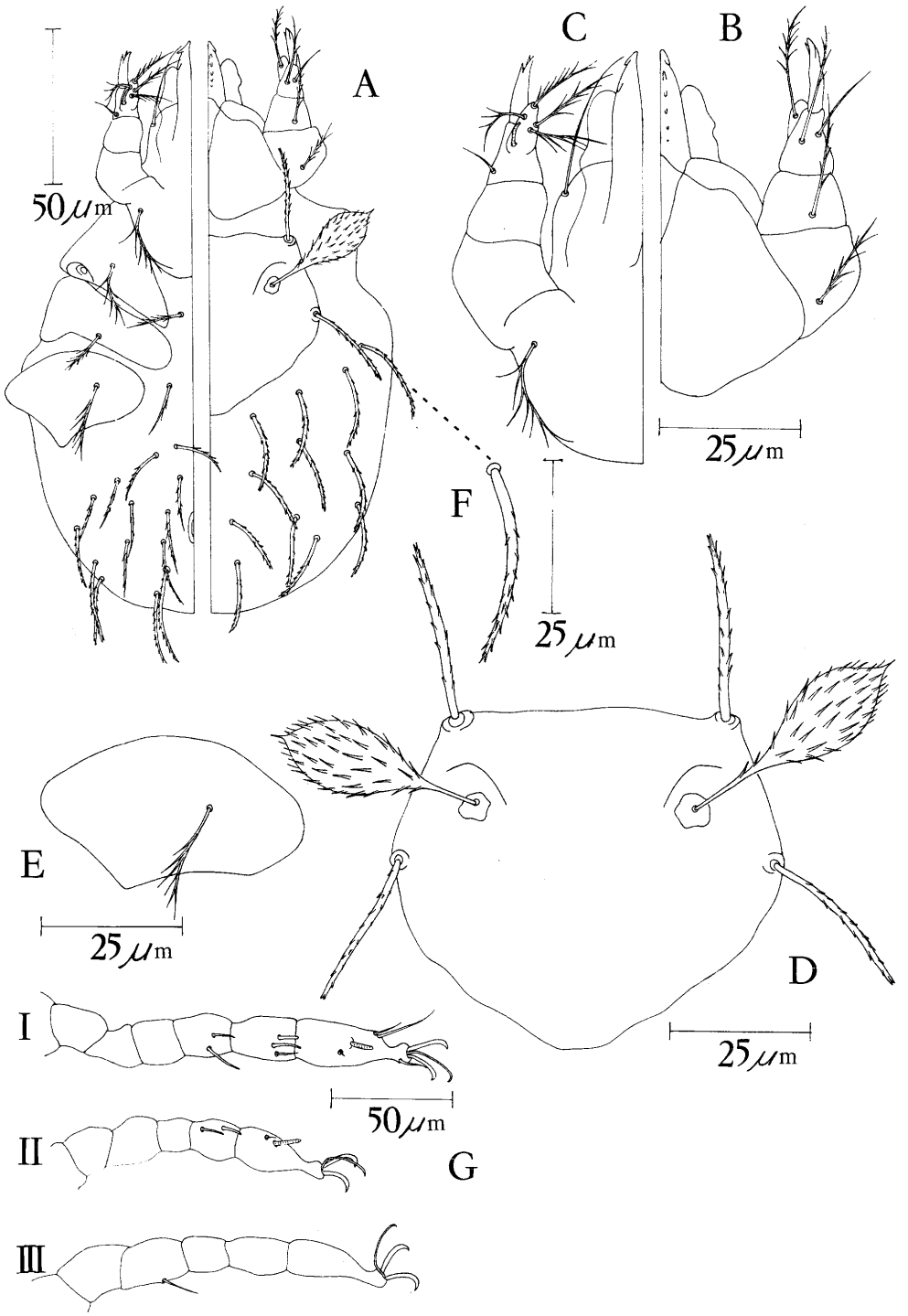

Fig. 1. *Walchia (Ripiaspichia) khunyingi* Suzuki n. sp.
A. unengorged larva, left ventral, right dorsal; B. gnathosome, dorsal; C. gnathosome, ventral; D. scutum; E. coxa III; F. humeral seta; G. leg with specialized setae.

wide. No eyes.

Gnathosome: Palpotarsal pilous formula: 5B. Palpal formula: B/B/BNN. Three (3) pronged palpotibial claw. Nude galeal setae. Chelicera bearing a row of 5 short teeth behind tricusped cup.

Scutum: Large half circle having roundness at rear portion. Larger standard measurement values comparing to that of *hayashii*. Pyriformed sensilla with smooth basal root and sharp seta on surface of global part. Same 30 μm length of al and pl, and no am seta. Standard measurement are shown in Table 1.

Table 1. Standard measurements of *Walchia (Ripiaspichia) khunyingi* n. sp. (in micra)

	AW	PW	SB	AP	ASB	PSB	SD	am	al	pl	s	AS	PS	pp-ss	pp	hm	dsp
Holotype	47	68	37	28	18	43	61	—	30	30	38	15	18	+12	35	35	27
Paratype	45	68	35	28	18	43	61	—	30	30	38	15	20	+10	35	33	25

Body Setae: Dorsal setae resembling scutal setae, total 24 in number, arranged 2-6-6-6-2-2. Ventral setae 28, 2 pairs of sternal setae.

Legs: Leg Ⅰ. 7-segmented; leg Ⅱ and Ⅲ, 6-semented, coxal setae 1-1-1; seta of coxa Ⅰ situated in middle of coxa. Leg Ⅰ: 180 μm long length of tarsus 40 μm; 1 genuala, 1 microspur, 1 pretarsala. Leg Ⅱ: 140 μm long, length of tarsus 33μm; 1 tibiala, 1 tibial spur, tarsal spur, microspur. Leg Ⅲ: 160 μm long, length of tarsus 38 μm; 1 femorala-like seta.

Material studied: A specimen collected on 22nd and another on 23rd of Feb. 1979 at Doi Inthanon, 2,400 m elevation of northern Thailand.

Holotype: TA-17-1. Doi Inthanon, Thailand 1979. 2.22

Paratype: TA-17-2. Doi Inthanon, Thailand 1979. 2.23

Note: The species is dedicated to Dr. Khunying TRANAKCHIT HARINASTA, Deputy Dean of the Faculty of Tropical Medicine, Mahidol University.

Walchia (Walchia) suvajrai SUZUKI n. sp., Fig. 2 (A-G)

Diagnosis of Larva: This new species resembles to *W. (W.) morobensis* (Gunther, 1939) but is identified different from that in points of 2 pair of humeral setae, more number of dorsal setae, undeveloped short palpal femur and geun, longer and slender scutum, and longer SD. It also resembles to other species of genus *Walchia*, besides *morobensis*, of *W. (W.) soricicola* (Traub and Evans, 1957) and *W. (W.) traubaudyi* (Nadchatram, 1970). The two and the new species have pl seta at inward of scutum, but the former has characteristically long al setae (60μm) and is easily identified from the new species in shape of scutum. The latter has fusiformed sensilla and same interval length of al and pl, which are different from those of the new species.

Description of Holotype Larva: White body color as in alive; 140μm long and 110μm

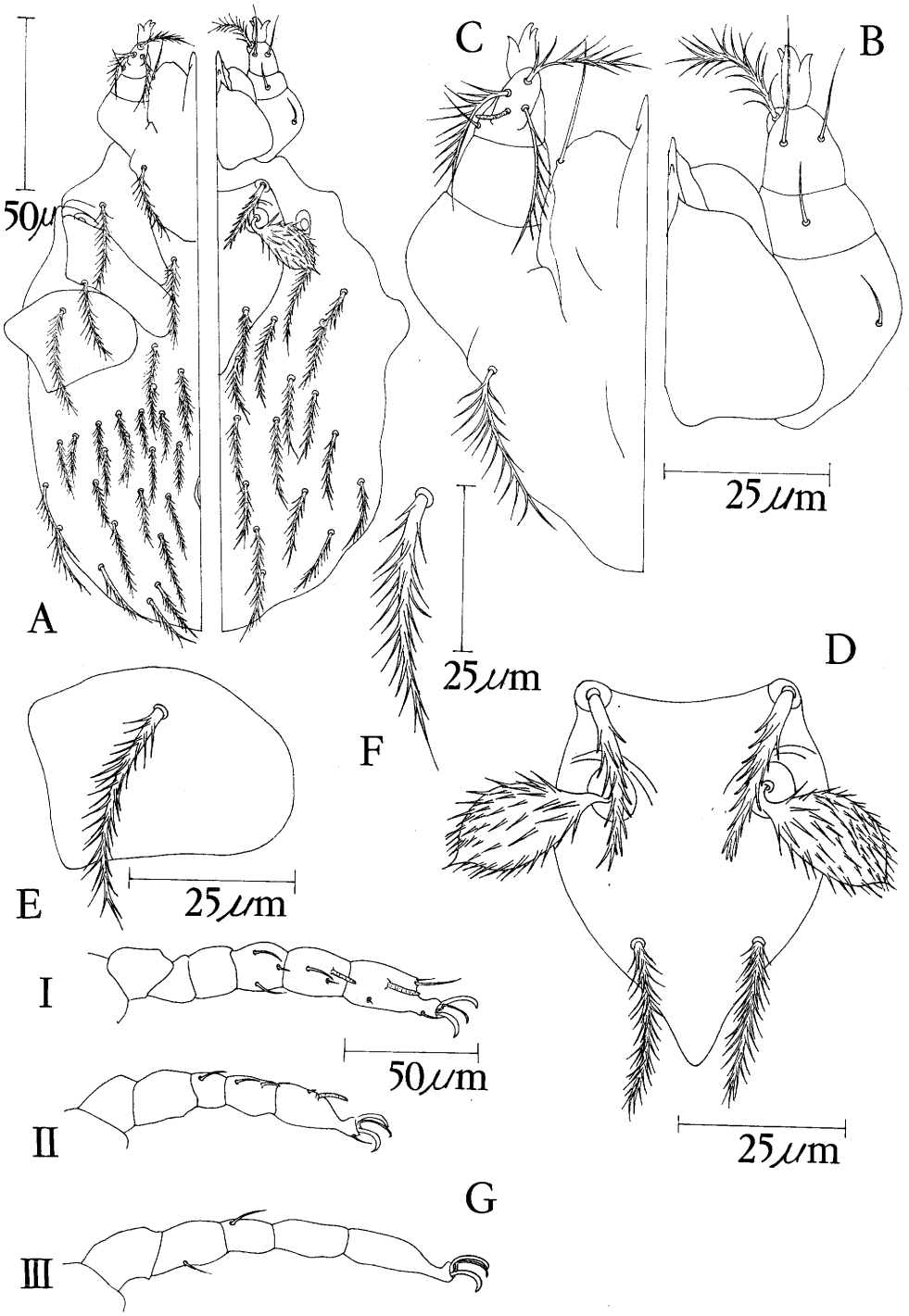

Fig. 2. *Walchia (Walchia) suvajrai* Suzuki n. sp.
A. unengorged larva, left ventral, right dorsal; B. gnathosome, dorsal; C. gnathosome, ventral; D. scutum; E. coxa III; F. humeral seta; G. leg with specialized setae.

wide. With eyes.

Gnathosome: Palpotarsal formula - 4B. Palpal formula: N/N/NNN.

Undeveloped short palpofemoral dorsal seta and palpogenual dorsal seta. 3 pronged palpotibial claws. Nude galeal seta. Small chelicera blade with weak subapical tooth.

Scutum : Shield shape. Shallowly concaved anterior margin between al and pl. Sharp pointed rear end. Sharp seta on surface of global shaped sensilla. Longer AW than PW. Standard measurements shown in Table 2.

Table 2. Standard measurements of *Walchia (Walchia)suvajrai* n. sp. (in micra)

	AW	PW	SB	AP	ASB	PSB	SD	am	al	pl	s	AS	PS	pp-ss	pp	hm	dsp
Holotype	32	20	25	38	20	38	58	—	28	25	25	13	23	+23	15	28	25
Mean of 10 paratypes	31	19	24	36	19	36	55	—	25	26	27	14	23	+23	16	28	26
Range	30-33	15-20	23-25	33-38	18-20	33-40	53-58	—	23-28	25-28	25-30	13-15	18-25	+18-25	15-20	28-30	25-28

Body Setae : Dorsal setae resembling scutal setae, total 32 in number, arranged 4−6−6−6−6−4−2. Ventral setae 46, 2 pairs of sternal setae.

Legs : Leg Ⅰ, 7−segmented ; leg Ⅱ and Ⅲ, 6−segmented ; coxal setae 1−1−1 ; seta of coxa Ⅰ situated in near part of anterior margin of coxa.

Leg Ⅱ : 160 μm long, length of tarsus 33 μm ; 2 genuala, 1 microgenuala, 1 tibiala, 1 tibial spur, 1 microtibiala, 1 tarsal spur, 1 subterminala, 1 microspur, 1 pretarsala.

Leg Ⅲ : 130 μm long, length of tarsus 28 μm ; 1 genuala, 1 tibiala, 1 tibial spur, 1 tarsal spur, 1 microspur, 1 pretarsala. Leg Ⅱ : 160 μm long, length of tarsus 35 μm ; 1 femorala−like seta, 1 genuala.

Material studied : 2 specimens collected on 22nd and 13 specimens on 23rd of Feb. 1979 at Doi Inthanon (elevation 2,400 m and 1,700 m).

Holotype : TA−19−1. Doi Inthanon, Thailand 1979. 2. 23

Paratypes : TA−19−2−13, same data as holotype.

Note : The species is dedicated to Dr. Suvajra VAJRASTHIRA, Head of Department of Helminthology, Faculty of Tropical Medicine, Mahidol University.

Walchiella (Walchiella) harinastai SUZUKI n. sp., Fig. 3 (A−G)

Diagnosis of Larva: This new species is characterized with peculiar shape of scutum and also with bump−like swollen basal position of pl, coxa Ⅲ setae, 3 pairs of the 1st row of dorsal seta, 2 pairs of the 2nd row, a pair of the 3rd row and 10 ventral setae (See Fig. 3, A. D. E.). Such a swollen feature is also found at a pair of sternal setae and coxa of legs Ⅰ and Ⅲ of *W. (W.) amamiensis* SUZUKI, 1976.

The scutum of the new species is almost rectangle and surrounding part of pl at posterior margin is pronouncedly out of edge and then curved inside. Eyes are situated

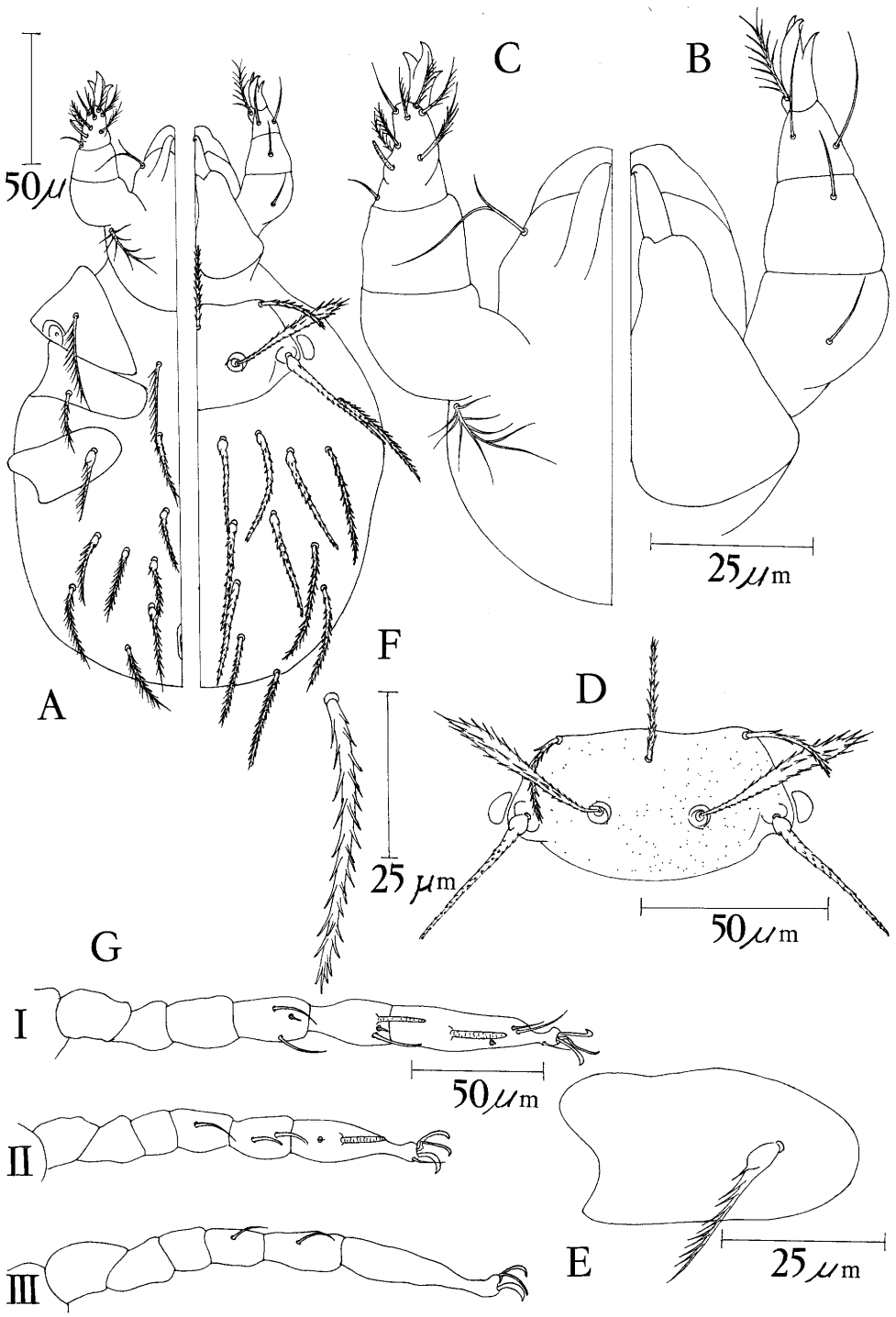

Fig. 3. *Walchiella* (*Walchiella*) *harinastai* Suzuki n. sp.
A. unengorged larva, left ventral, right dorsal; B. gnathosome, dorsal; C. gnathosome, ventral; D. scutum; E. coxa Ⅲ; F. humeral seta; G. leg with specialized setae.

very close to pl and eyes of 2 specimens are looked as if they are inside of scutum. Brennan reported (1968, 1972) eyes of *Trombicula almae* Brennan, 1968, *Peltoculus bobbiannae* Brennan, 1972 and *Hoffmannina reedi* Brennan, 1972 found inward of scutum saying "Eyes are an integral part of scutum". Therefore, this species should easily be identified from other species of genus *Walchiella* because of its peculiar form.

Description of Holotype Larva : White body color as in alive, 150 μm long and 140 μm wide. Eyes located close to pl.

Gnathosome: Palpotarsal pilous formula: 7B. Palpal formula: N/N/NNN. 3 pronged palpotibial claws. Galeal seta having a long thin brench.

Scutum : Widerectangular shape ; pl area projecting out and edge of posterior margin corved inward. Eyes of 2 specimens appeared to be inside of scutum. Fusiformed sensilla with rough spines at basal position. Swollen basal position of pl with shorts seta which differ from those of am and al. Standard measurements shown in Table 3.

Table 3. Standard mesurements of *Walchiella* (*Walchiella*) *harinastai* n. sp. (in micra)

	AW	PW	SB	AP	ASB	PSB	SD	am	al	pl	s	AS	PS	pp-ss	pp	hm	dsp
Holotype	55	73	30	23	23	20	43	33	28	48	50	25	23	0	15	48	48
Mean of 2 paratypes	54	70	32	24	24	19	43	33	25	48	50	25	20	0	16	49	48
Range	53-55	70-73	30-33	23-25	23-25	18-20	43	33	25-28	45-50	50	25	20-23	0	15-18	48-50	48

Body Setae: As to the dorsal seta, longer seta are seen respectively at a pair of humeral seta, right end of the 1st, 2nd and 3rd rows and at a pair of the 4th and 5th rows. Contrarily, sharp and short seta with swollen base are seen at 3 pairs of the 1st row, 2 pairs of the 2nd row and a pair of the 3rd row, which are resemble to pl seta. Total number of seta is 24 arranged in 2−8−6−4−2−2.

As to the ventral seta, swollen base of sterual seta are seen at 5 pairs of anterior anal region and a pair between Ⅲ legs. Total number is 14 including 2 pairs of sternal seta.

Legs: Swollen base are recognized at leg Ⅰ, Ⅱ and Ⅲ; 7−segmented, coxal seta 1−1−1; and at seta of coxa Ⅲ. Leg Ⅰ: 230 μm long, length of tarsus 53 μm; 2 genualae, 1 microgenuala, 1 tibiala, 1 tibial spur, 1 microtibiala, 1 pretarsala, 1 subterminala, 1 parasubterminala, 1 tarsal spur, 1 microtarsala. Leg Ⅱ: 190 μm long, length of tarsus 40 μm; 1 genuala, 1 tibiala, 1 tibial spur, 1 parasubterminala, 1 tarsal spur, 1 microtarsala. Leg Ⅲ: 210 μm long, length of tarsus 55 μm; 1 genuala, 1 tibiala.

Material studied: Nakon Nayok, Thailand 23 July 1978, 3 specimens.

Holotype: TA−1−1. Nakon Nayok, Thailand .978. 7. 23

Paratypes: TA−1−2, TA−1−3. Nakon Nayok, Thailand 1978. 7. 23

Note: The species is dedicated to Dr. Chamlong HARINASUTA, Dean of the Faculty

of Tropical Medicine, Mahidol University.

Leptotrombidium (Trombiculindus) santasirii Suzuki n. sp., Fig. 4 (A–G).

Diagnosis of Larva: Trombiculid mites of Genus *Leptotrombidium* and Sub–genus *Trombiculindus* are commonly distributed in Southeast Asia and are characterized by foliated body seta. All previous studies (Traub *et al*, 1951; Womersley, 1952; Jameson *et al*, 1953, Traub *et al*, 1967, 1968) reported those mites carry foliated shape in pl, humeral seta and dorsal seta (except a right end pair of the 1st, 2nd, 3rd and 4th rows of dorsal seta of *L. (T.) maxwelli* Traub and Nadchatram, 1967, which is not foliated but thread shape).

This new species, however, has thick thread shape of pl. humeral seta and a right end pair of the 1st row of dorsal seta (see Fig. 4, A, G and F). Therefore, this species is easily identified from other species of sub–genus *Trombiculindus*.

Description of Holotype Larva: White body color as in alive; 200 μm long and 160 μm wide. Eyes situated close to pl.

Gnathosome: Palpotarsal pilous formula–7B. Palpal formula–N/N/BNB. 3 pronged palpotibial clow and branched galeal seta.

Scutum: Rectanglar shape, shallowly concaved anterior margin between als. Short distance (15 μm) between als and pls. Thick am with sharp ortsh lateral branch. Pl, not foliated like other species of sub-genus *Trombiculindus*, resembling to als and having many lateral branches. Sensilla having 1/3 of short lateral branch and 2/3 of thin lateral branch. Standard measurements shown in Table 4.

Table 4. Standard measurements of *Leptotrombidium (Trombiculindus) santasirii* n. sp. (in micra)

	AW	PW	SB	AP	ASB	PSB	SD	am	al	pl	s	AS	PS	pp-ss	pp	hm	dsp
Holotype	58	75	33	15	30	18	48	73	35	70	85	28	25	−10	28	65	50

Body Setae: A pair of humeral setae and right end of the lst row of dorsal setae are in thread shape, not foliated. 28 in total number arranging 2–8–6–6–4–2. 30 ventral seta with 2 pairs of sternal seta.

Legs: Leg I, II and III, 7–segmented, coxal setae 1–1–1; seta of coxa III situated in near part of anterior margin of coxa. Leg I: 220 μm long, length of tarsus 45 μm; 2 genualae, 1 microgenuala, 2 tibial spurs, 1 microtibiala, 1 pertarsala, 1 subterminala, 1 parasubterminala, 1 tarsal spur, 1 microtarsala. Leg II: 210 long, length of tarsus 38 μm; 1 genuala, 1 tibiala, 1 tibial spur, 1 parasubterminala, 1 tarsal spur. Leg III: 240 μm long, length of tarsus 55 μm; 1 genuala, 1 tibiala.

Holotype: TA–12. Doi Inthanon, Thailand (elevation 2,400 m), 22 Feb, 1979.

Note: The species is dedicated to Dr. Santasiri SORNMANI, Head of Department of Tropical Medicine, Faculty of Tropical Mediine, Mahidol University.

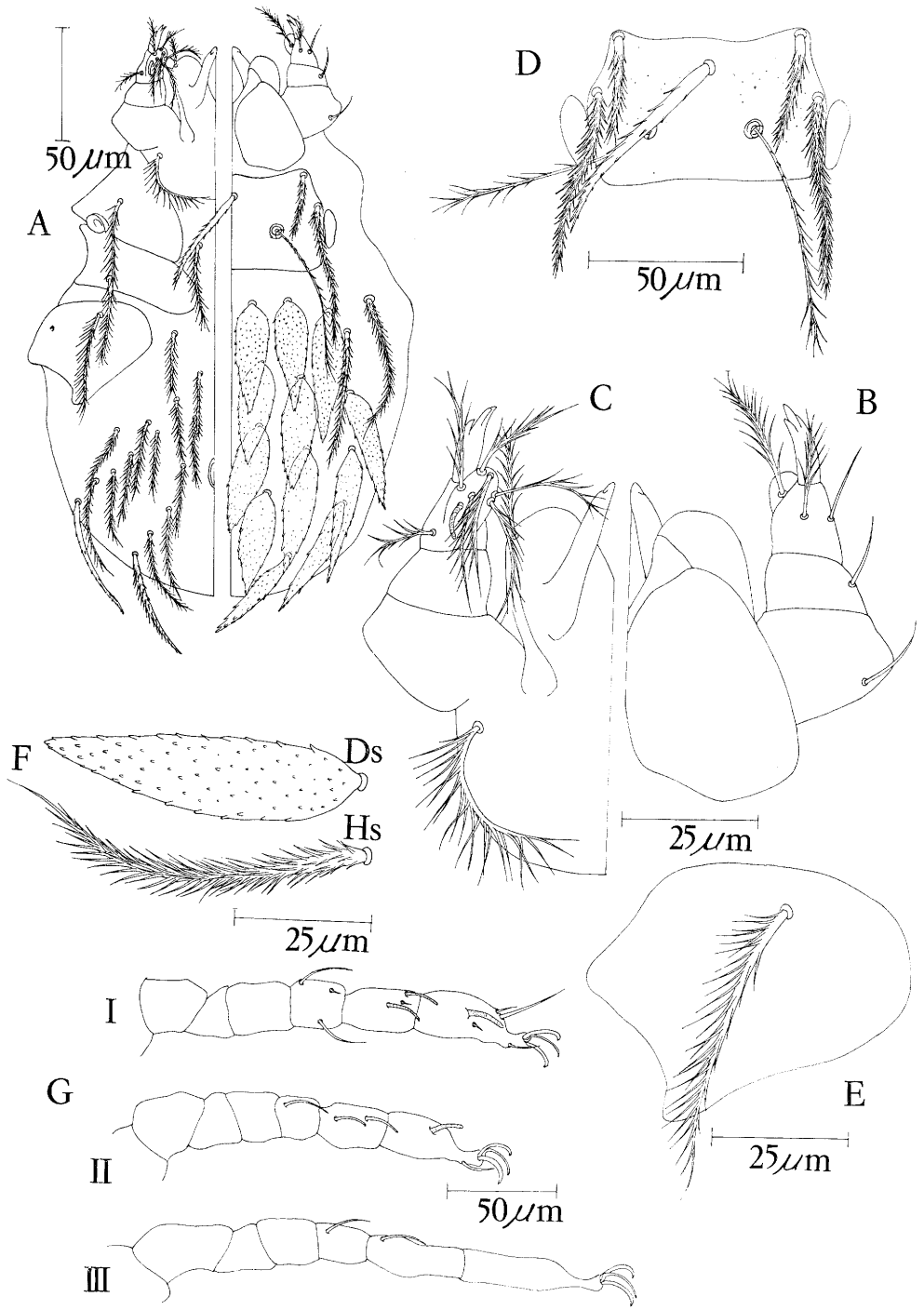

Fig. 4. *Leptotrombidium* (*Trombiculindus*) *santasirii* Suzuki n. sp.
A. unengorged larva, left ventral, right dorsal; B. gnathosome, dorsal; C. gnathosome, ventral; D. scutum; E. coxa III; F. humeral seta; G. leg with specialized setae.

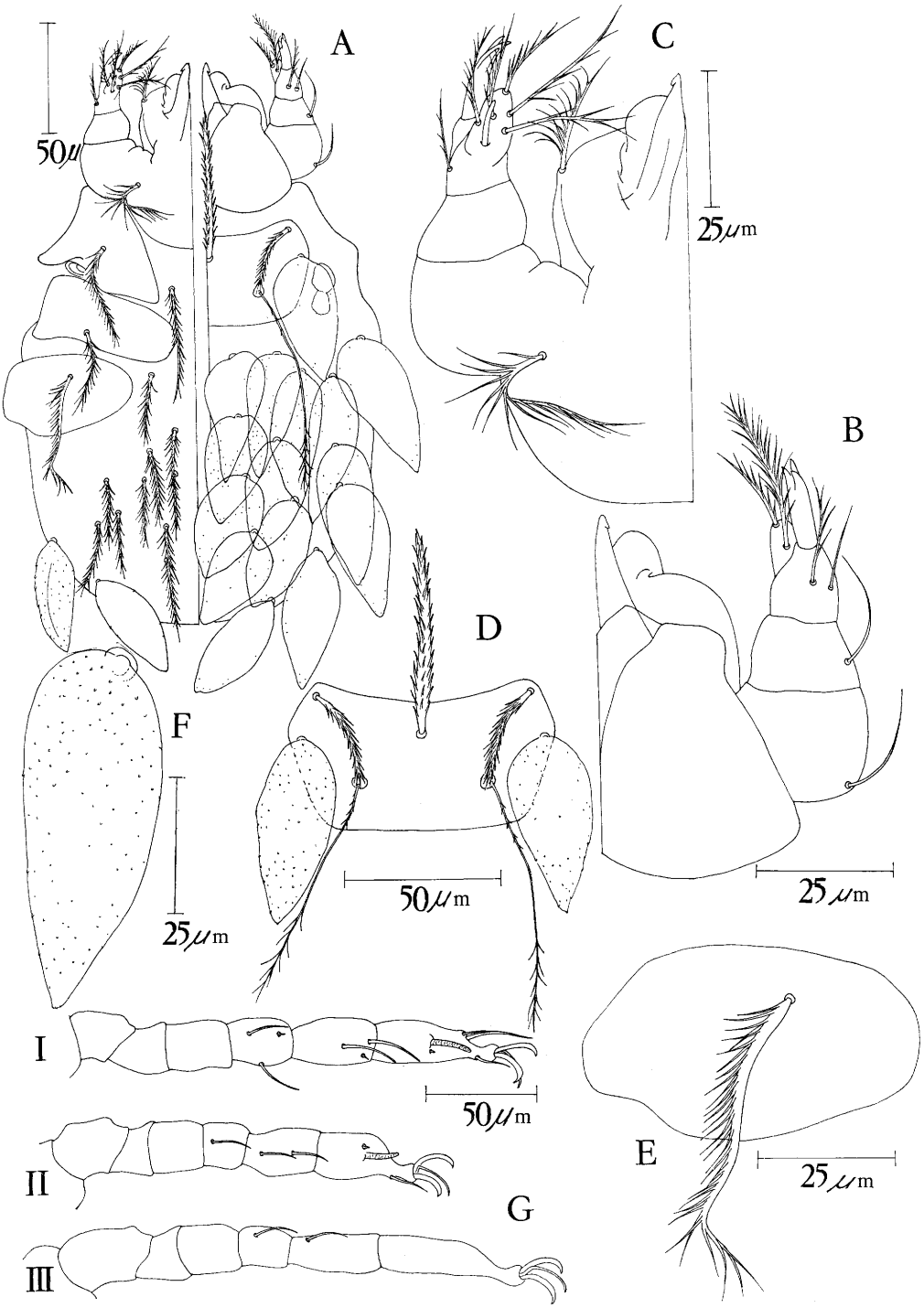

Fig. 5. *Leptotrombidium* (*Trombiculindus*) *manooni* Suzuki n. sp.
A. unengorged larva, left ventral, right dorsal; B. gnathosome, dorsal; C. gnathosome, ventral; D. scutum; E. coxa III; F. humeral seta; G. leg with specialized setae.

Leptotrombidium (*Trombiculindus*) *manooni* Suzuki, n. sp., Fig. 5 (A−G)

Diagnosis of Larva: This species resembles to *L.* (*T.*) *imbricutum*, but differs from that in palpal formula of N/N/BNB (N/N/BNN for *imbricutum*). Short and wide pl and dorsal setae; longer al and cox III seta.

Description of Holotype Larva: White body color as in alive; 180 μm long and 150 μm wide. Eyes; 2+2.

Gnathosome: Palpotarsal pilous formula−7B. Palpal formula−N/N/BNN. 3 pronged palpotibial claw. Branched galeal seta.

Scutum: Deeply concaved anterior margin. Als and pls located inside of scutum. Sensilla having short spines near basal position, smooth middle area and long lateral branches near the apex. Wide pl of 63 X 28 μm. Standard measurements shown in Table 5.

Table 5. Standard mesurements of *Leptotrombidium* (*Trombiculindus*) *manooni* n. sp. (in micra)

	AW	PW	SB	AP	ASB	PSB	SD	am	al	pl	S	AS	PS	pp-ss	pp	hm	dsp
Holotype	75	88	45	15	38	18	56	68	38	60	85	33	25	−15	30	63	53
Mean of 10 paratypes	74	86	45	17	35	17	52	69	27	63	80	33	25	−15	31	62	54
Range	73-75	85-88	43-48	15-18	33-38	15-18	50-56	65-70	33-38	58-68	75-85	30-38	25-27	13-15	30-33	63-65	53-60

Body Setae: 28 in total resembling to pls, arranging 2−8−6−6−4−2. 24 ventral seta with 2 pairs of sternal seta.

Legs: Leg I, II and III, 7−segmented, coxal setae 1−1−1; coxa III setae 60 μm long. Leg I: 240 μm long, length of tarsus 48 μm; 2 genualae, 1 microgenuala, 2 tibialae, 1 microtibiala, 1 pretarsala, 1 subterminala, 1 parasubterminala, 1 tarsal spur, 1 microtarsala. Leg II: 220 μm long, length of tarsus 38 μm; 1 genuala, 2 tibialae, 1 parasubterminala, 1 tarsal spur, 1 microtarsala. Leg III: 250μm long, length of tarsus 50 μm; 1 genuala, 1 tibiala.

Material studied: TA−19−2−1−26, Doi Inthanon, Thailand (elevation 1,700 m). 1979. 2. 23, 26 specimens. TA−20−1, Doi Inthanon, Thailand (elevation 1,700 m), 1979. 2. 24.

Holotype: TA−19−2−1, Doi Inthanon, Thailand, 1979. 2. 23.

Paratypes: TA−19−2−2 − TA−19−2−22, Doi Inthanon, Thailand, 1979. 2. 23.

Note: The species is dedicated to Dr. Manoon BHAIBULAYA, Department of Helminthology, Faculty of Tropical Medicine, Mehidol University. Holotypes and paratypes will be deposited in the National Science Museum, Tokyo, Japan and some paratypes will be deposited in collections of the author.

ACKNOWLEDGMENT

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TRANAKCHIT HARINASUTA, Dr. Suvajra VAJRASIHIRA, Dr. Santasiri SORNMANI and Dr. Manoon BHAIBULAYA, the Faculty of Tropical Medicine, Mahidol University for valuable asistance in performing this survey in Thailand, and also to Prof. Masashi OHBAYASHI, Dr. Masao KAMIYA and Dr. Haruo KAMIYA, Department of Parasitology, Faculty of Veterinary Medicine, Hokkaido University for giving the author an opportunity of the survey and helping collection in Thailand. Gratitude also extend to Dr. Hisashi ABE, Department of Applied Zoology, Faculty of Agriculture, Hokkaido Univ. for collecting and identifying small mammals in the survey.

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タイ国の寄生虫相

4．タイ国産恙虫の5新種

鈴木　博（長崎大学熱帯医学研究所ウイルス学部門）

1978年度文部省海外学術調査（東南アジアを中心とする寄生虫の系統分類学的研究，代表者：北海道大学獣医学部寄生虫病学教室，大林正士教授）の分担研究者として，タイ国の小哺乳類の外部寄生虫相について調査した．（1978年，1979年）

この内，恙虫に関して以下の3属4亜属5種を新種と認め，それぞれ，*Walchia* (*Ripiaspichia*) *khunyingi* n.sp., *Walchia* (*Walchia*) *suvajrai* n.sp., *Walchiella* (*Walchiella*) *harinastai* n. sp., *Leptotrombidium* (*Trombicuindus*) *santasirii* n,sp., *Leptotrombidium* (*Trombiculindus*) *manooni* n.sp. と命名し記載した．

これらの標本は，いづれも野鼠の巣坑道と思われる場所の土壌から Tullgren 装置を用いて，未吸着幼虫で採集したものである．

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